

REMARKS

Applicants' counsel appreciated the courtesy of the PTO interview granted by Examiner Donald Heckenberg on November 25, 2002. The claims and the prior art were discussed at length. Applicants counsel understood Examiner Heckenberg to say that Applicants' alignment features, including the thermal expansion properties of Applicants' structure, may distinguish over the art of record. In view thereof, the Examiner's comments together with the cited references have been carefully studied. Favorable reconsideration in view of the foregoing amendments and following remarks is respectfully requested.

Affirmation of the provisional election with traverse to prosecute the invention of Group I, claims 1-6 is hereby made.

The specification has been updated to correct the problems kindly noted by the Examiner.

Claims 1-6 are pending in the application. Claims 2 and 3 have been canceled. Claim 1 herewith is amended. Claims presently active are claims 1 (amended), and 4-6.

Respectfully, the rejection of Claim 3 under 35 U.S.C. 112, first paragraph, is moot in view of the cancellation of Claim 3.

Claims 1-6 stand rejected under 35 U.S.C. 112, second paragraph. The rejection is traversed. Applicants respectfully made necessary amendments to the claims in accordance with the Examiner's comments in the Office Action. These amendments are deemed to now conform the claims to the requirements of the rules.

Claims 1-3 and 5-6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cumming in view of Fujimoto et al. The rejection is traversed. It is the conclusion of the Examiner that "It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to have modified the apparatus of Cumming as such to have provided the apparatus with a first and second platens because this would have allowed the mold base to be used in a pressing operation as suggested by Fujimoto. It also would have been obvious...to have modified the apparatus of Cumming as such to have provided the mold bases with guide pins and

corresponding apertures because this would have aided in guiding and aligning the mold bases when the mold is opened and closed as suggested by Fujimoto.” The Examiner also concludes, “...it would have been obvious to one of ordinary skill in the art at the time of the Applicant’s invention to have modified the apparatus of Cumming as such to have provided two bushings or apertures on each inserts because this shift in the location of the parts would not effect the apparatus operation.”

Applicants respectfully take the position that Cumming, alone or in any legally permissible combination with Fujimota, neither teaches nor suggests applicant’s invention, as presently claimed. First, Applicants submit that Cumming is directed to the use of an electroforming process to make optical inserts for molding intraocular lenses. The Cumming’s development relies on a set of alignment pins - one female and one male - that are electroformed onto the optical inserts with the lens surfaces. Further, according to Cumming, to make a complete mold cavity, two electroforms are required that are “rotated 180 degrees relative to one another on their common axis to form the two sides of a single cavity intraocular lens mold as shown in Cumming’s Figure 9” and in the specification at Col. 9, Line 45. Furthermore, Cumming, as well as Fujimoto and Maus, requires the use of straight alignment pins that must have a clearance between the male and female surfaces to allow for sliding contact during engagement. Typically this must be at least 2.5 microns on each alignment pin. Still further, Applicants respectfully submit that since the Cumming’s development requires that the electroformed alignment pins be electroformed in sets - with one male and one female alignment pin on each electroformed optical insert - any locational inaccuracy of the alignment pins relative to the lens feature is compounded when the two electroform alignment pins are rotated 180 degrees and put together to form the mold cavity. Typically the best accuracy possible for a pin location is around 2 microns. However, in rotating the one electroform alignment pin relative to the other to bring the two halves of the lens mold together, the inaccuracy of the one side adds to the inaccuracy of the other so that the lens surfaces are only accurate to $2 + 2 = 4$ microns. Therefore, it is Applicants’ view that the Cumming’s development is only capable of

producing lenses with surfaces that are located accurately to within $2.5 + 2.5 + 2 + 2 = 9$ microns.

In contradistinction, Applicants' invention requires the use of tapered guide pins that encourage alignment without a required clearance between the surfaces thereby maximizing the alignment accuracy. Further, to eliminate the clearance between the alignment pin and the bore that it is held in, we actually choose a material that has a slightly higher thermal expansion coefficient than the mold plates so that as the mold is heated up to operating temperature, the alignment pins grow into the plate bores and the clearance is thereby eliminated. Importantly, the tapered alignment pins of the present invention do not require a clearance and they would typically be line bored across the parting line so that the inaccuracies of the alignment pin locations do not compound so that the overall accuracy limit is 2 microns. This result represents a substantial difference from Cumming.

In view thereof, it follows that the subject matter of the claims 1 (as amended), 5 and 6 would not have been obvious of Cumming in view of Fujimoto et al. at the time the invention was made.

Claim 4 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Cumming modified by Fujimoto et al. and further in view of Maus et al. The rejection is traversed. It is the conclusion of the Examiner that "It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to have modified the apparatus of Cumming and Fujimoto as such to have made the mold an injection molding assemblage because this is suitable way to form the desired molded product as suggested by Maus."

Applicants take the position that claim 4 depends directly or indirectly from claim 1 (as amended) and, therefore, incorporates all of the patentable features thereof. Hence, claim 4 is deemed allowable for the same reasons argued above for the patentability of claim 1.

In view thereof, it follows that the subject matter of claim 4 would not have been obvious of Cumming in view of Fujimoto et al. and further in view of Maus et al. at the time the invention was made.


Applicants have reviewed the prior art made of record, and believe that singly or in any suitable combination, they do not render Applicants' claimed invention unpatentable.

In view of the foregoing remarks and amendment, the claims 1 (as amended) and 4-6 are now deemed allowable and such favorable action is courteously solicited.

Should the Examiner consider that additional amendments are necessary to place the application in condition for allowance, the favor is requested of a telephone call to the undersigned counsel for the purpose of discussing such amendments.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

Respectfully submitted,


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Enclosures: Version With Markings To Show Changes Made (page 1-2),
2 sets (7 sheets each) formal drawings

Version With Markings To Show Changes Made

In the Specification:

The paragraph beginning on page 1, line 5 has been amended as set forth below:

The present application is related to U.S. Application Serial Number [(D-81785), filed herewith] 09/702,952, filed October 31, 2000, by John Border, et al., and entitled, "Method Of Manufacturing A Microlens Array Mold And a Microlens Array;" U.S. Application Serial Number [(D-81786), filed herewith] 09/702,362, filed October 31, 2000, by John Border, et al., and entitled, "Apparatus For Forming A Microlens Mold;" U.S. Application Serial Number [(D-81787), filed herewith] 09/702,500, filed October 31, 2000, by John Border, et al., and entitled, "Apparatus For Forming A Microlens Array Mold;" U.S. [Application Serial Number (D-81788), filed herewith, by] Patent Number 6,402,996, issued June 11, 2002 to John Border, et al., and entitled, "Method Of Manufacturing A Microlens And A Microlens Array;" U.S. Application Serial Number [(D-81168), filed herewith] 09/702,402, filed October 31, 2000, by John Border, et al., and entitled, "Method For Making A Microlens Mold And A Microlens Mold;" and, U.S. Application Serial Number [(D-81799), filed herewith] 09/702,302, filed October 31, 2000, by John Border, et al., and entitled, "Double-Sided Microlens Array."

In The Claims:

Claim 1 has been amended as set forth below:

1. (Amended) Apparatus for manufacturing a double-sided microlens, comprising:

a first mold base and a second mold base, said first mold base having a first alignment member for cooperating with correspondingly aligned second alignment member in said second mold base, and wherein each of said first mold base and said second mold base has [a first and second flexible insert, respectively, for accommodating] a pair of juxtaposed mold cavities for receiving a microlens mold in a fixed relationship, each one of said pair of juxtaposed mold cavities having a solid

plastic material disposed at least partially therein and a set of alignment features for aligning with said pair of juxtaposed mold cavities containing said solid plastic material [said first flexible insert with said second flexible insert], and wherein said first alignment member comprises a pair of spaced guide pins disposed in a pair of corresponding spaced apertures formed in said second mold base, said spaced apertures having a pair of spaced tapered bushings arranged therein for receiving said spaced guide pins; and,

a molding assemblage having a first platen and an opposing second platen, said first platen supporting said first mold base and said second platen supporting said second mold base for molding a double-sided microlens in said microlens molds.

Claims 2 and 3 have been canceled.